ENGINEERING DEPARTMENT.

MYSORE DIVISION.

Notification, dated 20th February 1933.

FORM OF ADVERTISEMENT.

Notice is hereby given that sealed tenders will be received at the Office of the Executive Engineer, Mysore Division, up to 12 noon on 13th March 1933, for Constructing a Girder Bridge (Baltimore Type) across River Kabini at T.-Narasipur (about 20 miles from Mysore). An approximate estimate of quantities is given below. These quantities are not guaranteed. The work should be completed by the end of June 1935.

2. The plans, detailed estimate and conditions may be seen at the Executive Engineer's Office at Mysore between the hours of 11 A.M. and 5 P.M., on all office days.

3. Tenders should be submitted on printed forms which may be obtained from the Executive Engineer. The tenders should be accompanied by a statement in the form given below, showing the rates at which the different items specified will be executed.

4. The tender may be for the complete bridge including steel work and masonry and other works, or for steel work or masonry, etc., separately.

5. Each tender must be accompanied by a deposit of rupees 15,000 in cash or Government Promissory Notes, for the complete Bridge, or rupees 7,500 for either steel work, or masonry and other works, separately, as earnest money, and be superscribed "Tender for Constructing a Girder Bridge (Baltimore Type) across River Kabini at T.-Narasipur" in default of which, tenders will be rejected.

6. The final acceptance of any tender will rest with the Government of Mysore, who do not bind themselves to accept the lowest or any tender or to assign any reason whatever for the rejection of any tender.

7. Within fifteen days of the acceptance of the tender, the successful competitor will be required to execute the usual contract bond; in default of which his tender will be considered cancelled, and his earnest money will be forfeited.

8. The name of the successful competitor, whose tender has been accepted will be posted on the notice board in the Executive Engineer's Office and will be intimated is due course. No enquiries regarding the acceptance or rejection of a tender will receive any reply.

9. On acceptance of one of the tenders, the earnest money on rejected tenders will be returned.

10. Charges on account of scaffolding materials, implements for setting out, clearing site, supply of water, etc., that may be found necessary during execution will not be paid for separately, but should be borne by the contractor.

11. Intending tenderers will make their own arrangements for all machinery required for the work and their quotations for unwatering foundations and river diversion will be lumpsum which figure will not be susceptible of alteration at any time.

12. Rates for non-tendered and non-estimated items shall be as per schedule rates of the Department or those fixed by the Executive Engineer after working out data with not more than 10 per cent for contractor's profit.

13. In all matters not specifically provided for and in all matters of disputes about rates, quantities, measurements, quality of works, etc., and in all disputes of any kind, the decision of the Chief Engineer will be final and legally binding.

14. Quotations must be given in words as well as in figures and they must be in specific term of unit shown against each item of work. Any quotation quoted at so much percentage less or more than estimate rate will not be accepted.

15. Any tender containing a conditional clause contrary to these requirements or marking stipulations not provided for either in this advertisement or the abstract quantity will be summarily rejected.

16. Works must be carried out strictly in accordance with the printed specifications appended for steel work and masonry and other works.

17. If the masonry work is delayed when the steel work is ready for fixing, the contractor for the former will have to compensate the contractor for steel work for delay caused for erection of girders.

18. In the case of steel work, quotation must be per ton including trough plates for bridge floor; and the total weight of steel work must be given for the bridge complete.

19. Rate for steel work will be for the complete work and will include carting to site, erection, etc., complete the usual finish and all painting as noted in the abstract.

20. Rate for earthwork will include lead, lift, carting, consolidation, complete.

21. Alternative quotations may also be given per cubic foot for reinforced cement concrete decking with the Baltimore Type of Truss of the bridge.

22. The Department reserves to itself the right of modification of design of the Baltimore Type of Truss, if found necessary.

23. The contractor shall be bound by the Schedule of contract of the Department.

24. Once the tender is accepted, no claim for any increase in rate, on any ground, at any time, will be entertained.

Abstract estimate for Constructing Girder Bridge (Baltimore type) with 9 spans of 80 feet and 2 spans of 60 feet across the river Kabini at T.-Narasipur.

No.	Items of work	Per	Quantity
	I. BRIDGE PROPER.		
1	Earthwork excavation in mixed soils sand clay and soft rock with ? to 1 slope..	Cy.d.	11,594
2	Planking, shoring, sheet piling or other contrivances and baling water. 10 piers and 2 abutments Each	L.S.	...
3	Benching hard rock	S.ft.	5,264
4	Granite metal concrete with surki mortar mixed with cement proportion 2 surki 1 cement.	C.ft.	4,760
5	Coursed rubble masonry (abutting course) in surki mortar mixed with cement including bond slabs. 2 mortar 1 cement.	„	4,422
6	Coursed rubble in surki mortar as per proportions specified for different levels including the use of bond stones 5 to 10 per cent of the quantity.	„	1,85,937
7	Cement concrete bearing slab with reinforcement of 3/8" mild steel round bars. 1 cement 2 sand 4 granite metal jelly.	„	401
8	Cement pointing	Sqr.	228
9	Rough pointing with surki mortar mixed with cement, 1 mortar 1/3 cement from top of abutting course to bed level of river.	„	111·72
10	Ornamental cornice 1½' deep below parapet ..	R.ft.	192
11	Ornamental parapet 3' high with coping in 2 line dressed stone as per design including pointing, etc.	„	192
12	Ornamental pedestals over returns and ends of railing of approach roads.	Each	12
13	New stone revetment with jelly packing ...	C.yd.	575
14	Gravel backing for revetment 6" thick	„	107
15	Diversion of river during construction	L.S.	...
16	Earthwork filling in between returns and in the excavated trench and for approaches out of stuff got from the excavations of abutments.	C.yd.	3,000
	II. APPROACH ROADS.		
1	Clearing seat of approach banks	C.yd.	1,115
2	Earthwork left and right banks with 1 in 30 ft. slope ...	„	10,000
3	Iron railings with stone uprights as per design ..	R.ft.	1,200
4	Rough stone revetment with jelly packing ..	C.yd.	1,400
5	Gravel backing 6" for revetment	„	622
6	Soling with 3" unbroken field metal including collecting and consolidating with necessary gravel.	„	272
7	Forming road with 1" granite metal including collection and consolidation of gravel.	„	272
	III. MISCELLANEOUS ITEMS.		
1	Forming a suitable circle at the junction of Cauvery and Kabini approach roads.	L.S.	...
2	Construction of a slabbed culvert of one vent of. 5' x 5' on the left bank and one irrigation pipe tunnel.	„	...
3	Improving Tirumakudlu approach road	„	...

Details of steel work for Baltimore Type of truss including erection 3 coats of anti-corrosive Shalimar graphite paint 80 feet span.

Details for 80 feet span—

Top Boom—
Length 18'—6" B. F. B. 10" x 10" at 61 lbs. per foot.

Bottom Boom, (End Length)—
Length 28'—7½" R. S. C. 2 channels 10" x 3" at 19·28 lbs.

Bottom Boom (Inter Length)—
Length 27'—6" R. S. C. 2 channels of 10" x 3½" at 24·46 lbs.

Ends Posts—
Length 18'—6" B. F. B. 10" x 10" at 61 lbs.

Main Verticals (Central)—
Length 14'—10" 4 ls. 3" x 2½" x 5/16" at 5·51 lbs.

Main Verticals (Intermediate)—
Length 14'—10" 4 ls. of 3" x 2½" x 3/8" at 6·54 lbs.

Main Verticals (Ends)—
Length 14'—10" 2 ls. of 3" x 2½" x 3/8" at 6·54 lbs.

Sub Verticals—
Length 7'—9" 2 ls. 3" x 2½" x 5/16" at 5·51 lbs.
2'—6" do do

Main Diagonals (Central)—
Length 17'—6" 2 ls. 5" x 3" x 3/8" at 9·72 lbs.

Main Diagonals (End Panels)—
Length 17'—6" 2 ls. 6" x 3½" x 3/8" at 11·68 lbs.

Sub-Diagonals (Upper)—
Length 8'—9" 2 ls. 3" x 2½" x 5/16" at 5·51 lbs.

Sub-Diagonals (lower)—
Length 8'—3" 4 ls. 2½" x 2" x 5/16" at 4·45 lbs.

Rakers (Main Angles)—
Length 14'—10 2 ls. 3" x 2½" x 5/16" at 5·51 lbs.

Rakers Bracings (long)—
Length 7 ft. 2 ls. 2½" x 2½" x 5/16" at 4·98 lbs.

Bracings (Short)—
Length 2'—9" 2 ls. 2½" x 2½" x 5/16" at 4·98 lbs.

Cross Girders (long)—
Length 32'—0" R. S. J. 18" x 6" at 55 lbs.

Cross Girders (short)—
Length 21'—6" R. S. J. 18" x 6" at 55 lbs.

Standards—
Length 5'—0" 2 ls. 3½" x 3½" x 5/16" at 7·11 lbs.

Guard Plates—
Length 14'—10½" } Plates 2' x 2½" x 3/16"
} Angles 2½" x 2½" x ¼" at 4·04 lbs.
13'—9" } Cover plates 6" x 1'—9" x ¼"

Bearing Plates—
2 x 1'—11" x ⅜"

Troughing—
Length 8'—0" } Plates 1'—2" x ¼" at 0·283 lbs.
6'—10½"

Hand Railing—
Length 16'—0" } 1" bore gas pipes at 1·63 lbs. per foot.
12'—0"
5'—2"

Bearings—
As in the drawings of the Executive Engineer's Office.

Lead Sheet—
1/8" thick at 7·41 lbs. per s.ft. under bearing plates.

Gussets—
7/16" and 3-16" thick as shown on drawing.

For other minor items, such as, battens, cleats, hand rails, clips, loose splice covers, troughing clips, rivets, etc., drawings in the Executive Engineer's Office, may be referred to.

No.	Items of work	Per	Quantity
1	Fixing old M. S. M. rails supplied departmentally on top of piers.	L.S.	2·64 tons
2	Lime mortar concrete filling in troughs	C.ft.	8,227
3	Forming roadway over bridge including collection of 1" granite metal with consolidation with necessary gravel, etc.	C.yd.	333
4	Gravel cushion over concrete half foot thick for roadway over bridge including collection and consolidation.	,,	300
5	Rain water spouts	L.S.	...
6	Tarring roadway over bridge with Sparamex ...	,,	...

For 60' span details are the same as above except variations in lengths of top and bottom chords, diagonals, etc., as shown in the drawing.

Specifications for Baltimore Type of Truss of 80' Spans for the Kabini Bridge at T.-Narasipur.

The truss is 13½' between centre to centre of booms consisting of details of members as shown below. The truss is designed to allow for pedestrain traffic at 84 lbs. per S.ft., of floor area and a 15 ton Steam road roller with 50 per cent allowance for impact provides for the maximum live load expected on the bridge. Width of road way is 18' clear. Top width of masonry pier is 5'.

Impact allowance of 50 per cent is made for trusses also. Rivets to be used throughout.

All materials required for steel structure shall conform to the British standard specifications. They should be perfectly sound in texture and free from all bends, scales and defects of all kinds. Before despatch to the work spot, they are usually painted with one coat of paint and before erection, they shall be again painted with three more coats of fresh anti-corrosive Shalimar graphite paint.

All steel work during the course of fabrication and testing shall be subject to the inspection of the Executive Engineer or his representative.

No steel work shall be painted for the 2nd time before it has been examined by the Executive Engineer or Inspecting Officer.

The Executive Engineer may order the completion and fitting together on the ground of such portions of the work as he may deem expedient, and may cause the same to be subjected to a proper test before it is put into position.

In putting steel work together, greatest care is to be taken to fit the plates accurately in contact and to see that the rivets and recet holes correspond with each other before revetting up. All joints to be perfectly clean and freed from rust. Should any parts be bent or injured they are to be promptly repaired according to the instructions of the Executive Engineer.

In cases, holes do not exactly correspond they shall not be slotted out to fit but shall with the permission of the Executive Engineer, be enlarged with a circular bit and larger rivets used to fill the holes.

Rivets shall, if possible, be heated uniformly, throughout their whole substance, in an air furnace, the rivets being kept clear of the fuel. Great care is necessary in heating rivets to prevent the iron from burning and becoming brittle.

In erecting girders, the different parts are to be fitted together with service bolts, and packed up to camber before rivetting is completed, care to be taken to keep the girders laterally straight.

In fixing bed plates, special care must be taken to put the holding-down bolts exactly in positions, so that the nuts may bear square and firmly grip the plate below. The upper surface of bed plates must be exactly at the specified level. Bed plates should be set in cement all foundation bolts grouted with cement mortar (1 : 2).

It is very necessary that skilled workmen and maistries thoroughly acquainted with the structural steel work should be employed by the contractors and the whole work after completion should present a neat finish and sound workmanship.

Specifications for masonry and other works in constructing a Girder Bridge across the river Kabini at T.-Narasipur.

General.—The Executive Engineer in charge of the bridge works shall have full powers and authority to issue such instructions as to the procedure and execution of work, as he may deem necessary from time to time for the guidance of the contractor and the contractors shall be bound by such instructions of the Executive Engineer or person or persons authorised by the Executive Engineer to give instructions. The contractors shall have an authorised Agent on the work, who shall be responsible to the Officer in charge of the works, for the proper and prompt execution of works as per approved designs and specifications.

2. The contractors shall at all times keep an order book on the work and shall produce it whenever required by the Executive Engineer or subordinates in charge.

3. The Contractors shall employ efficient maistries or overseers for setting out and through supervision of works. Should the Officer in charge consider any such Maistry unfit, the Contractors shall cease to employ the individual on receipt of an order in writing.

4. Works will generally be measured not less than once a month. All measurements will be entered in the usual measurement book kept for the purpose and the contractors or their duly authorised Agent should be present when measurements are being taken and take copies thereof at the time of measurement if they require them, as copies will not be supplied, nor will notice be taken to any objection to any measurement, unless the objection is put forward in writing at the time of measurement and to the Measuring Officer.

5. All pegs, bamboos and labour necessary for setting out measuring and setting works shall be supplied by the contractors, the cost thereof being covered by the rates tendered.

6. The contractors shall provide at their own cost all tools and plant for carrying out work.

7. Defective work of any kind, whenever discovered must at once be made good by the contractors. All rubbish old and superfluous materials shall be removed by the Contractors at their own cost from neighbourhood of the work immediately on completion.

8. All rejected materials should be removed from site by the contractors to such distance as may be ordered by the Officer in charge, failing which, the Executive Engineer is empowered after giving 15 days notice in writing to do so himself and to recover the cost of the same from the contractors.

9. The contractors shall not commence any item of work until it has been properly set out by the officer in charge.

10. Excavation for foundation. Foundation trenches shall be taken down to sound hard rock or other suitable substratum that may be approved and passed by the Executive Engineer.

11. Regarding payment for excavation of foundation of piers and abutments, $\frac{1}{2}$ to 1 slope is allowed for purposes of measurement for all piers and abutments.

12. The contractors shall make necessary arrangement for all shoring, pumping, dredging, baling out or draining water from foundation trenches, it shall be kept free of water while the masonry is in progress in such manner as the Executive Engineer may direct. The lumpsum amount tendered by the contractors shall cover all the expenses to be incurred for the purpose stated above.

13. The bottom of foundation pits shall be dressed level in all directions so as to receive foundation courses, the sloping portions being terraced or benched to receive horizontal footings.

14. After benching, the surface shall be left quite clean and rough.

15. All good soil obtained from excavation for abutment foundation shall be used for filling in between abutment returns and approach banks.

16. All foundation pits must be refilled to the original surface of the ground with approved materials obtained from the foundation excavation, well watered and rammed.

STONE MASONRY.

17. Pits and cavities in the bed of foundation should be thoroughly cleared and filled with concrete in cement mortar, well consolidated before work is started.

18. Stones shall be those taken from quarries approved by the Executive Engineer. They shall be hard, durable, tough and free from weathered surface, and each stone shall be laid in the work, on its natural quarry bed.

19. The stones shall be laid in horizontal courses not less than 7" in height at the top. All the stones in each course shall be of equal height. No course shall be thicker than any course beneath it. The bottom course for the superstructure should not be less than 10" in depth. In foundation the depth of courses may vary from 10" to 12". All stones to be set full in mortar.

20. No face stones shall be less in breadth than their height, nor shall they tail into the work to a length less than their height and at least one third of the stones shall tail into the work at least 1½ times their height.

21. Stones shall break joints at least half the height of the course.

22. The face stones to be squared on all joints and beds. The beds to be hammer dressed, true and square, for at least 3" back from the face and the join at least 1½".

23. In every course bond stones shall be inserted at intervals of 6 to 5 feet, and no bond stones shall be less than 2 feet long in piers and abutment.

24. No pinning will be allowed on the face. All side joints shall be truly vertical and beds horizontal and no joints shall be more than ¾" in thickness.

25. *Quoins.* and cut waters shall be built of stones of same height as that of the course in which they occur, shall be formed of header stones at least 1½' long, laid lengthwise alternately along each face. They should be laid square on their beds, which should be fairly dressed of at least 4". Stones used for quoins and cut waters shall be chisel-drafted at the corners above foundation level. No separate rates shall be paid for chisel-drafting quoins.

26. The interior of the masonry shall consist of flat bedded stones carefully laid on proper beds and solidly bedded in mortar, care being taken that no dry work or hallow spaces shall be left anywhere in masonry.

27. The face work shall be brought up evenly but the backing should not be levelled up at each course by the use of chips.

28. Stones should be thoroughly wetted before being laid in the work for which each mason should be supplied with a vessel for wetting stone.

29. The proper watering of all masonry should be carefully attened to. Should the mortar in masonry perish, *i.e.*, become dry, white or powdery through neglect of watering or otherwise, the work should be pulled down and rebuilt at the Contractors' expense and should they fail to water the work to the satisfaction of the Officer in charge of the work, the latter may supply the requisite men to water the work properly and charge the cost to the contractors.

30. All masonry shall be washed down on completion and all stains (mortar or otherwise) removed from the face.

31. The rates for stone masonry shall include the cost of bond stones and also the of scaffoldings, etc.

LIME.

32. The lime to be burnt from lime stone or kankar approved by the Executive Engineer or his representatives. The contractors shall bring to site, the freshly burnt quick lime and store it at the work spot in covered sheds. The roof of the sheds must be water tight and they must also be protected along the sides. The lime to be used should be fresh, well burnt and free from under-burnt and over-burnt lumps. By the work "fresh" is meant within 7 days of the date on which it was drawn from the kiln. The lime which has perished or mortar which has set shall on no account be used on the works. All impurities in the lime or imperfectly burnt pieces, if any, shall be carefully picked out and removed from the site. Sufficient quantity of good ground and sieved lime for 3 days work shall always be kept at site in proper sheds and covered with sand to a depth of ½" or so.

SAND.

33. The sand to be used for mortar shall be course in texture, clean, shar and gritty to the touch and freed by the watering from all clay, earth and other impurities. It must be of the best quality available in the river bed, in the locality and to be approved by the Executive Engineer. It should all pass through ⅛" square sieve.

SURKI.

34. Surki should always be made from freshly and partially burnt bricks of good quality. No over-burnt bricks will be allowed.

35. Bricks containing too much of sand and lumps of stones, etc., shall be rejected. They should be broken into not more than 3" cube when power mills are used.

MORTAR.

36. The ingredients for mortar to be used for the bridge work shall be of the best quality mentioned above.

37. For foundation works the proportion of mortar shall consist of—

One part of slaked lime Two parts of surki	up to R. L. 30·00.

For superstructure—

1½ slaked lime 1 of surki 2 of sand	Above R. L. 30·00 or other proportions which may secure maximum strength.

38. The slaked lime is to be first placed in the power mill in an even layer and ground with sufficient quantity of water for 10 minutes. Next surki shall be added and finally the sand shall be put into the mill and the mixture thoroughly ground for not less than 25 minutes on the whole, the time for grinding alone being from 15 to 20 minutes.

39. In order to ensure thorough mixing, scrapers should be used in the power mills and stirred continuously during the process of grinding, particularly in the angles of mill.

40. Water may be added during grinding as required, care being taken not to add more water than will bring the mixed materials to the consistency of stiff paste.

41. The water used for mixing mortar should be clean, free from mud clay or other impurities.

42. All mortar should be used as soon as possible after it is ground. It shall be kept damp in the shade or covered up till used and if it has set or hardened before they use, it shall be considered unfit and removed from the work and no second of it shall be allowed. The mortar shall in no case be deposited on the ground. The mortar being hydraulic must generally be used on the day on which it is ground and in no case more than 48 hours after.

43. All mortar or materials which the Officer in charge considers to be of different quality or to have been spoiled should be removed within 12 hours, the officer or subordinate in charge may cause them to be destroyed at Contractor's expense and in no case will the Contractors have any claim for the value of such materials removed or destroyed.

44. If any bullock mills are permitted to be used by the Executive Engineer, the usual specifications shall be followed.

45. All masonry made up of surki mortar should be kept wet by constant watering for three weeks after completion to ensure the thorough setting of mortar.

BURNT STONE SLAB 8" THICK.

46. The slabs should be of sound hard rock and obtained from quarries approved by the Executive Engineer. They should be free from fissures, cracks and seams of loose decayed materials. Slabs over piers shall measure 5½' long 1½' to 2' wide and 8" thick after they are fully 2 line dressed. The edges should be straight and free from unsightly chippings. The joints should not be more than 1/8" thick and the slabs should be set flush in surki mortar over the masonry projecting 3" on either side of the pier. The joints shall be raked out deep enough and pointed with cement mortar 1 : 3. The top surface which carries the girder bearings, shall be even, horizontal and to the required level.

CEMENT POINTING.

47. Cement used for pointing shall be of the approved quality and should comply with the standard specification. It should be quite fresh, and preserved carefully. The proportion of cement mortar shall be in the ratio of 1 cement and 3 sand.

48. Pointing shall be, if possible, done whilst the mortar in the joints is fresh.

49. Before pointing the work, the joint, to be raked to a depth of ¾" and the surface well wetted. The joints should be rubbed smooth as soon as the mortar has began to set. The exact joint should be struck with a trowel on a straight edge, the edges, of pointing to be nearly trimmed and no splashing to be allowed. The joints of the pointed work shall be neatly defined by the pointing and the line shall be regular and uniform in breadth and truly horizontal or vertical.

50. Pointing shall be executed as rapidly as possible and not again touched after it has once began to set, which it will do very soon. It must be kept constantly wetted for 2 weeks.

ORNAMENTAL STONE CORNICE ½' DEEP.

51. To be as per working drawings that will be supplied or as ordered by the Executive Engineer, as the work proceeds. Materials and workmanship to be of first class. The rate for this work, shall include the cost of two line dressing, cement pointing and finishing to the required profile.

ORNAMENTAL PARAPET.

52. To be of the type to be approved by the Executive Engineer. The stones and the surki mortar to be used shall be of the quality mentioned above. The workmanship to be of the best type.

53. The coping to be of the uniform width of 1'-9" throughout and 6' high. The slabs should be projected 3" only on the outer side of the parapet, with a chamfered top edge 1" deep. No two stones should be used to make up the required width height of coping. All visible angles and edges to be free from unsightly chippings. The coping shall be in as long stones as are easily obtainable and shall break joints with stones below. The slabs must be 2 lines fully dressed.

The rates tendered to cover all dressing, setting in surki mortar and cement pointing.

54. Pedestals shall be as per approved designs.

TAR CONCRETE FILLING IN TROUGHS.

55. The troughs in which concrete shall be laid, will be painted with 2 coats of tar. The concrete shall consist of 1 part of lime mortar (1:2) and 2 of stone jelly (not more than 1¼" cubes). It should be laid gently in the troughs and rammed well so as to leave no voids in the corner or in the body of concrete. The jelly should be washed clean and thoroughly mixed with half the quantity of the lime mortar on suitable platforms. If the work is properly carried out and ramming well done, mortar should cream up the surface. Grouting may be needed at the angles and corners. Concrete shall be kept for a week after it has been laid by means of watering can with rose attached. The surface of concrete shall be in one uniform level with upper surface of troughs after thorough consolidation.

ROAD FORMATION.

56. The quarries for road materials of whatever kind is obtained must be approved by the Executive Engineer.

57. The granite metal shall be of a close, tough, hard texture and be broken so as to pass in every direction through a 1½" ring. Each piece should be square and sharp, no round or oblong pebbles, no angular chips or flakes and no stones larger than what is above specified shall on any account be used.

59. Sand used for blinding road surface should be sharp, gritty and clean.

60. No road material shall be stacked until it has been thoroughly screened and freed from all impurities, etc.

61. The metal to be carefully spread to an average depth of 6", The surface will be laid with a regular curve with central rise of three inches.

62. The metal to be saturated with water and rammed with rammers or rolled with heavy rollers until thoroughly consolidated, *i. e.*, until the wheels of the ordinary loaded vehicles passing over it leave no impression.

63. The consolidation of metal once thoroughly done, a blinding of good gravel to be spread over it to a depth of 1½" and well watered and consolidated. Over this, as a finishing coat, ¼" layer of sand should be spread evenly over the gravel and the roller should be passed over it for half a day.

64. To facilitate proper check over the proportions of road materials, they should be regularly stacked so as to admit of easy measurement.

NEW STONE REVETMENT.

65. The stones should be of hard variety. They should be laid on proper beds, with their lengths at right angles to the slope. They should be closely packed with sufficient quantity of jelly. Loose pebbles and jelly should on no account be poured over the surface so as to cover all defects. All voids in the body of the revetment should be carefully filled in and the surface voids closed with long pieces of stones carefully wedged. The surface of revetment to be true to the correct slope, even, out of all winding and free from depressions or prejections. Any settlement of revetment either due to bad workmanship or indifferent consolidation of earthwork behind should be made good by the contractors.

EMBANKMENT.

66. Before the earthwork for bank is commenced, the ground to be occupied by its base, will be thoroughly cleared of all trees, shrubs, grass prickly pears, rubbish of all sorts, loose stones and soft stuff, stumps and roots being entirely grubbed up.

67. The surface soil consisting of sand, etc., shall be removed to such depth as may be directed by the Executive Engineer.

68. The surface of sloping ground on which the bank is to be formed shall invariably be prepared to receive the earthwork, by having cut in the slope a sufficient number of footings or benches forming a right angle with the slope of the embankment.

69. As already stated, all good soil obtained from excavation for foundation of abutments should be used up for embankment.

70. No mud, slush, sand or watery stuff and no decayed vegetable matter or rotten stuff of any kind shall be allowed to be put into embankment.

71. Before commencing the embankment, the foot of the slopes on each side will be marked by pegs firmly driven into the ground at regular intervals, care being taken to place them at right angles to the centre line, profiles made of bamboo or other convenient material and a string will be set up for the guidance of workmen. The profiles will show the total height including allowance for settlement. The toe of the slope shall be marked by a trench at least six inches deep.

72. The embankment is to be raised (after the site has been properly prepared and well watered) in regular layers slightly concave in section and the earth is to be thrown down from the sides towards the centre not *vice versa*. The layers will be 9" thick and will be rammed and consolidated by using water. They will be carried out to the full width of the slopes in all instances, so that no additions may be required to the slopes after the bank has been brought up to formation level including allowance for shrinkage.

73. All lumps and clods of earth are to be broken up so as to allow of a regular subsidence of earthwork throughout.

74. In carrying up embankments, the full allowance of ten per cent for shrinkage shall be made at first so that no addition of earth will be required after settlement to bring the bank up to its full dimensions.

75. The top embankment is to be brought up to the levels set out (including the allowance for shrinkage) and to be neatly trimmed. The slopes are to be dressed to the required inclination and neatly trimmed.

76. In long embankments the earthwork should be left with long steps or benches at the close of a day's work and before new earth is put in, the old surface will be well watered and scored so that the old and new earthwork may properly adhere to each other.

77. For all other works not specified above, the usual departmental specifications will be followed.

DIVERSION OF RIVER.

78. The lumpsum provision made is for diverting the water in the river during the working periods and is irrespective of the number of seasons of construction.

K. NARAYANA IYENGAR,
Executive Engineer.

HEADQUARTER RANGE, BANGALORE.

Notification, dated the 19th February 1933.

Notice is hereby given that sealed tenders will be received at the Office of the Assistant Engineer, Headquarter Range, Bangalore, up to 10th March 1933, (2 P.M.) for constructing a building for locating the Urdu Middle School for Mysore State Troops at Hebbal, Bangalore. An approximate estimate of quantities is given below. These quantities are not guaranteed. The work should be completed by the end of July 1933.

2. The plans, detailed estimate and conditions may be seen at the Assistant Engineer's Office, at Headquarter Range, Bangalore, between the hours of 11 A.M. and 5 P.M. on all working days.

3. Tenders should be submitted on printed forms which may be obtained from the Assistant Engineer. The tenders should be accompanied by a statement in the form given below, showing the rates at which the different items specified will be executed both in words and in figures.

4. Each tender must be accompanied by a deposit of Rupees three hundred only in cash or Government Promissory Notes, as earnest money, and be superscribed "Tender for constructing a building for locating the Urdu Middle School, for Mysore State Troops, Bangalore," in default of which, tenders will be rejected.

5. The final acceptance of any tender will rest with the Superintending Engineer, Mysore Circle, who does not bind himself to accept the lowest or any tender or to assign any reason whatever for the rejection of any tender.

6. Within eight days of the acceptance of the tender, the successful competitor will be required to execute the usual contract bond, in default of which, his tender will be considered cancelled, and his earnest money will be forfeited.

7. The name of the successful competitor, whose tender has been accepted, will be posted on the Notice Board in the Assistant Engineer's Office in due course. No enquiries regarding the acceptance or rejection of a tender will receive any reply.

8. On acceptance of one of the tenders, the earnest money on rejected tenders will be returned.

9. Percentage rates above or below the estimate rates will not be accepted.

10. No claims for enhanced rates will be entertained on any account after acceptance of tenders.

11. The contractor will be dealt with in terms of the bond for any short progress or delay. In matters of all disputes about rates, measurements, quality of work, etc., the decision of Chief Engineer will be final and legally binding over the contractors.